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ABSTRACT

Stuttering is explained to be a time and rhythm speech disorder. The overview in outline form on stuttering notes the nature of the disorder, primary and secondary types, incidence, age of onset, stutterer's profile, intelligence, psychological traits, physiological traits, sociological traits, predisposing conditions, precipitating conditions, perpetuating conditions, and history. Theoretical examination of the etiology of stuttering notes that traditional theories of stuttering have differed primarily in the inferences concerning the nature of the causal factor. The theories are categorized and briefly discussed in groups of physical or neurological, psychological, and physiogenic and psychogenic etiologies. Discussion of therapy notes that various and sundry methods have been used in treatment of stuttering, ranging from methods that focus upon treatment of the symptom to methods dealing with the stutterer alone. Examination of conditioning approaches to treatment points out that conditioning or learning approaches emphasize that stuttering is a speech disturbance that could happen to anyone. A variety of conditioning theories are briefly noted. (CB)

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S T U T T E R I N G:

Overview in Outline Form

Etiology and Therapy

Conditioning Approaches to Treatment

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Abstract

Stuttering is a time and rhythm speech disorder with a long history, e.g., Moses, Aristotle, and Aesop were stutterers. In school-age children about 7/1000 manifest the disorder. There have been many studies profiling the stutterers' speech, physiology, psychology, and sociology. There are many theories with regard to precipitating and predisposing causes, with regard to symptom and stutterer therapies. Included are the conditioning approaches to treatment. Stuttering remains a formidable problem in speech therapy and special education.

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OVERVIEW IN OUTLINE FORM

I. Stuttering is a time and rhythm speech disorder

A. The stuttering syndrome

1. Stuttering is characterized by

a. Repetitions, blockings, or prolongations of sounds, syllables or words which disturb the rhythm of speech[1,4,5,11,24,25,33,34]

There are two types of spasms or prolongations

i. Clonic spasm--interrupted spasm[7]

ii. Tonic spasm--sustained spasm[7]

b. Stuttering is usually associated with tics, grimaces, facial spasms or spasmic movements of other parts of the body[4,5,7]

2. There are two types of stuttering

a. Primary--there is a nonfluency present in the normal child's development of speech; if this nonfluency becomes excessive it is considered primary stuttering.[5,11] In primary stuttering the child is

i. Not aware of the problem[5,11]

ii. Comfortable in speaking situations and does not try to avoid speaking situations[5,11]

b. Secondary--the person has become a full-blown stutterer; in secondary stuttering the person

i. Knows he is a stutterer[5,11]

ii. Struggles to avoid speaking situations[5,11]

iii. Is embarrassed by his nonfluencies[5,11]

3. Incidence

   a. Approximately 1% of the total population are stutterers[5]

   b. Approximately .7% (7/1000) of the school age population (C.A. 5 to 20) are stutterers[5]

   c. There are more males than females who are stutterers; depending on the source, there are 2 to 10 males for every female.

4. Age of onset

   a. The average age of onset is about 3 years, rarely is the onset after 9 years of age[5,24]

   b. There are sharp peaks of incidence occurring between 5 and 7 years and between 12 and 14 years[5]

   c. 90% of stuttering occurs under age 10[2]

5. Stutterer's profile

   a. Speech is characterized by

      i. Rigid voice--vocal inflexibility, limited pitch range, and lack of expressive coloring[5,24,34]

      ii. Breathing irregularities during speech--longer inspiration than exhalation, or equal inspiration and exhalation[5,24,34]

      iii. Articulation may be defective

         . lisping, lalling, and substitutions are more frequent in stutterers[5]

         . infantile patterns of articulation may be maintained longer[5]

         . stutterer's speech is poorly organized and may become disorganized when under stress[7]

   b. Intelligence

      i. Stutterers show at least normal intelligence[3,5]

      ii. Stutterers tend to be brighter than other speech defectives[5,11,34]

iii. College students who are stutteres tend to be above average[5,11]

c. Psychological traits

i. Stutteres in varying degrees are or may be

. diffident, fearful

. extremely sensitive

. self-conscious

. indecisive

. tense, anxious

. easily confused[3,7,13,17,24,33,34]

. different terms are used by various authors but basically all imply the same connotations as the terms listed above

d. Physiological traits

i. Numerous deviations found tend to be nonspecific and identical to those found in "constitutionally nervous" individuals.[13] These deviations include[13]

. neurological

. autonomic

. vasomotor

. metabolic

ii. Research indicates motor and kinetic speech efficiency deviations may be present; however, this seems to be true, generally, of other persons exhibiting some forms of speech pathology.[13] Examples of these deviations could include[2,3,13]

. lack of psychomotor control due to infantile motor development

. awkwardness of movements

. fidgetiness

. motor restlessness

. poor motor coordination

iii. There is a greater incidence of left handedness and ambidexterity in stutterers and in families of stutterers[5,24]

e. Sociological traits

i. Family background relationships

. parents of stutterers are inclined to be overprotective, perfectionistic, demanding and supervisory[3,4,5]

. the child often feels he is not an integral part of the family[3,4,5]

ii. Relationships with others

. the stutterer often feels isolated[4,13,17]

. stutterers may feel relatively incapable of developing mature relationships[4,17]

. extent and nature of participation in social situations seems to be related to the stutterer's own attitude toward stuttering[17]

iii. Cultural factors

. research seems to indicate the more a culture (American Indian) approximates white American culture, the greater the tendency for stuttering to occur[5]

B. Stuttering--predisposing, precipitating, and perpetuating conditions

1. Predisposing conditions

a. Instability of the neuromuscular mechanism[2,24]

b. Environmental conditions

i. Changes in the home[24,34]

ii. Temporary absence of the mother[24]

iii. Continuous pressure on the child to achieve[2,17,24,34]

iv. Etc., etc., etc.

c. Physiological conditions

i. Poor physical conditions as a result of

. malnutrition

. poor general health or temporary lack of well-being after an illness[24]

2. Precipitating conditions

a. Traumatic experience; sudden shock and/or frightening experience[1,2,5,17,24]

b. Speech consciousness--self-consciousness with regard to speech[17]

c. Correction of defective articulation--attempts to correct the faulty use of articulation in a young child may lead to frustration and excessive awareness of speech. This may interfere with fluent expression[5,17,25,24]

d. Imitation--a child may unconsciously imitate a stammer of another child or parent; this may lead to a gradual development of stuttering[24]

3. Perpetuating conditions

a. Fear and anxiety associated with the stutter symptom--once aware of his problem the child may attempt to withdraw from speech attempts or he may use effort to overcome the resistance to stutter; this may strengthen and perpetuate the pattern[1,3,5,11,17,24]

b. Parental correction--may increase the child's awareness of his difficulties and failure to speak fluently may become associated

with certain situations or with particular sounds in words[7,10,11,13,17]

c. Anticipation and expectation of stuttering--these conditions are closely associated with the occurrence of stuttering (this may be considered as part of the first perpetuating condition)[10,13,24]

C. The history of stuttering

1. Famous persons who were stutterers[2,4]

a. Moses

b. Aristotle

c. Aesop

d. Demosthenes

e. Virgil

f. Erasmus

g. Charles I

h. Charles Lamb

i. Charles Darwin

j. Sir Winston Churchill

k. King George VI

l. Somerset Maugham

2. Stuttering was originally thought to be a physical disorder[2,4]

a. Hippocrates said stuttering was due to dryness of the tongue[2,4]

b. Aristotle said stuttering was due to a too thick and hard tongue[2,4]

c. Francis Bacon said coldness and moisture of the tongue caused stuttering[2,4]

d. Santorini, an Italian anatomist, said the causative factor of stuttering was two holes of abnormal size located in the middle region of the palate[2,4]

e. Morgagni, founder of pathological anatomy, said the hyoid bone (a U-shaped bone at the root of the tongue) was the cause of stuttering[2,4]

f. By the middle of the 19th century, the idea the tongue was the basis of speech defects was firmly established; many European surgeons were operating on the tongue. In 1841 alone, in France, 200 cases of tongue operations were reported. At the end of the year a warning cry went up and those who had tried the experiment admitted themselves in error [2,4]

g. Until 50 years ago, stuttering was understood only slightly and was practically never remediable. The cause was thought to be physical, its nature erroneously described, and treatment often involved radical surgery, with tragic consequences. Today, underlying causes are not known but we are more knowledgable about factors contributing to the development of stuttering [2,4]

ETIOLOGY AND THERAPY

ETIOLOGY

The traditional theories of stuttering have differed primarily in the inferences concerning the nature of the causal factor. These theories can be categorized under three main headings: 1) physical or neurological, 2) psychological, and 3) physiogenic and psychogenic.[8,33] (Heading number three includes headings one and two.)

The first group of theorists have been concerned with appraising various biological phenomena, e.g., integration of neural firing, blood chemistry deviations, and possible inheritance of disorders of a physiological or neurological process.[5,8] Travis' theory of cerebral dominance would be classified in this category.[2,3] Briefly, this theory considered that a stutterer was essentially a left-handed individual who had been taught to use his right hand and that this had caused the symptom of stuttering. There have been many research studies conducted with regard to the inheritance of stuttering. Family histories of stutterers include the following as occurring more often than in the population as a whole: more stutterers, more left-handedness, more twins, later onset of speech, and a higher incidence of prolonged fevers that might cause a defect in the nervous system.[5,11,24]

The second group of theorists have been concerned with appraising various psychological phenomena, e.g., "....the stutterer's personality development, the emotional climate of the childhood home, guilt reactions and psychological conflict, and the reactions of other people to the child's speech."[8,pp.4-5] Coriat presents a psychoanalytic view of stuttering.[4,16] Essentially, he sees stuttering as a psychoneurosis developed from the fixation of psychic energy in one of the psychosexual stages of development.

He feels credence is given to this point of view because of the persistence of pregenital oral nursing, oral sadistic and anal sadistic components in the stutterer. The equivalents noted are the specific oral characteristics of the stutterer--the way he repeats, hesitates, blocks, or prolongs on the sounds he utters or stops himself from uttering. Van Riper has stated that the stutterer responds neurotically to his own speech.[34] When caught in a spasm, the stutterer reproduces an act of behavior which previously reduced anxiety and released him from a spasm. He feels anxious, he stutters, he finally says the word and relieves himself of anxiety. Thus, he thinks that stuttering helped him get rid of his anxiety.

The third group of theorists have tried to combine the physiological and psychogenic approaches. Generally they have proposed"....that a physiological or neurological weakness leads to a breakdown in speech production when the individual experiences fear or tension."[8,p.5] Bluemel's theory should be considered here.[7] He believed speech was a conditioned response and that stuttering was an inhibition occurring prior to the secure establishment of the speech reflex. This phenomena of conditioned reflex and inhibition is something experienced by all children when they are learning to acquire fluent speech. The inhibition could become severe and thereby produce stuttering if the child experienced excessive emotional shock, persistent illness, or continual emotional stress, causing fear and withdrawal. Stuttering has also been attributed to disturbance of thought processes. Froeschel calls stuttering "dissociative aphasia" as there is a deficiency in word finding and sentence formation and, later on, an interference between the thoughts which the patient wants to utter and ideas of existing speech difficulties.[2,4,16] Initially, the causes are largely physiological

in nature, later on, psychological reactions develop which may be considered a form of psychoneurosis. He feels there is evidence indicating stuttering is linked with the subconscious volition, the will to stutter.

Persons advocating the types of theories discussed have acknowledged that stuttering results from underlying causes, but they have not reached agreement on how these causes should be interpreted or treated.[16] The physiogenic theorists feel stuttering should be treated medically as it is like any other medical disorder, even though a psychological reaction may result from the physical disorder. The psychogenic theorists believe the disorder is psychological and its development is dependent upon interpersonal processes. They stress the development of personality dynamics and the effect of these dynamics on speech. The interactionists use an eclectic approach, combining the physiogenic and the psychogenic.

THERAPY

There have been various and sundry methods used in the treatment of stuttering. The methods used appear to lie along a continuum, from those that focus upon treatment of the symptom, to those which deal with the stutterer alone and tend to ignore the stutter.[1] An extreme example of the former would be operant conditioning; an extreme example of the latter would be psychoanalysis. Operant conditioning and the psychology of learning will be discussed in the last section.

Speech therapies used to treat stuttering include: the metronome method, negative practice, voluntary stuttering, hypnosis, syllable-timed speech, ventriloquism, pantomime, fake stuttering, shadowing, the chewing method, etc., etc. The metronome method involves having the stutterer speak in time to

rhythmic movements.[1] Negative practice entails learning to control a habit one would like to discard, in this instance stuttering,by practicing intentionally and purposefully that very habit.[11,33] Through this technique of self-imitation the stutterer "....is helped to undo by consciously doing what he prefers not to do."[11,p.329] Voluntary stuttering can use two techniques. In the first technique, the stutterer is directed to voluntarily repeat (easily without anxiety) the first sound or first syllable of each word as many times as he feels necessary before he can complete the rest of the word.[11,34] "With practice, the number of repetitions are reduced to the minimum needed by the stutterer to enable him to feel prepared to move along and to finish his utterance."[11,p.330] The second technique of voluntary stuttering is "....prolongation or the intentional lengthening of initial sounds that are capable of being lengthened....the stutterer must use the lengthened sound production as a preparatory set to move into the next sound and so to complete his utterance."[11,p.330] Hypnosis has been used to reduce the severity of stuttering either as a supplementary method of therapy,[23] or for direct inhibition of stuttering by post-hypnotic suggestion.[22] Syllable-timed speech is speaking in evenly separated "chest pulses,"[1] it is speaking "....syllable by syllable, stressing each syllable evenly and saying each in time to a regular even rhythm."[1,p.150] Ventriloquizing is a technique which is used to allow the subject to talk without closing his mouth and without moving his lips or tongue.[33] Essentially, the patient focuses his attention on ventriloquizing rather than on stuttering; the patient progresses "....from pure speech melody to ventriloquizing or from just avoiding every closure to normal articulation. Therefore, difficulties are avoided."[33,p.883]

Eisenson and Ogilvie[11] speak of articulatory pantomime and fake stuttering. Articulatory pantomime involves going through the articulatory activity without uttering the words aloud; this is an attempt to teach the stutterer "....there are no real difficult sounds but only 'bogey sounds' that the individual has somehow come to believe are difficult for him."[11,p.329-330] Fake stuttering is a group technique wherein the stutterer imitates speech features of another stutterer.[11] A feeling of control can be attained, if the stutterer is competent at imitating other stutterers. This feeling is conducive to imitating normal speech. Shadowing is a technique favored by Van Riper; it is also called "echo talk" or "echo speech."[34] The patient is trained to repeat instantly what he is hearing, following almost simultaneously the utterance of another person. The "chewing method" involves having the patient engage simultaneously in chewing motions and speech when he anticipates a stutter.[19] It is thought that this method focuses the patient's attention on the processes of chewing; thus, tension accumulated in the larynx is dissipated, the patient's anxiety about stuttering is reduced and this has the effect of reducing the probability of the stutter. "Other therapists have used such devices as speaking with the head thrown back, talking on all fours, speaking through the clenched teeth, speaking with objects held by the tongue in the mouth, speaking with a fixated thorax, talking while walking or moving the limbs and torso, using a belly thrust or gesture to time the moment of speech attempt, and many others."[33,p.881]

Some of the techniques mentioned above follow some principles of conditioning (especially classical). But conditioning is considered important and cogent enough to require a separate section.

CONDITIONING APPROACHES TO TREATMENT

The conditioning or learning approaches emphasize that stuttering is a speech disturbance that could happen to anyone.[4] The stutterer is viewed as someone who has learned to respond in a given way to certain stimulus conditions. Learning psychologists believe stutterers are not similar in terms of personality traits or types, rather "....the behaviors learned in relation to specific stimulus conditions are similar."[8,p.5] Learning psychologists emphasize behaviors--their antecedents and consequences. They approach the problem by attempting to determine the conditions of learning that produce stuttering behavior; once identified they attempt to modify or extinguish the response.[1,8,31]

Before discussing further the modification of maladaptive human behavior, in this case stuttering, a distinction between two types of behaviors should be made. For purposes of prediction and control, behavior is delineated as either respondent or operant (B. F. Skinner's language[29,30]). Respondent behavior "....is nearly synonymous with the layman's concept of an involuntary, elicited, or automatic response, and it is mediated by the autonomic nervous system."[35,p.6] In respondent (classical) conditioning, behavior is controlled by antecedents. Operant behavior, "....similar to the layman's concept of a voluntary, 'purposeful' response,"[35,p.6] is emitted, and it is mediated by the central nervous system. In operant (instrumental) conditioning, behavior is controlled by consequences. Operant conditioning procedures have been studied intensively by Skinner.

Stuttering can be considered operant or respondent behavior and there are various explanatory approaches to stuttering within these conditioning and learning frameworks. This paper will consider the approaches of

G. Shames and C. Sherrick, G. J. Wischner, J. G. Sheehan, W. Johnson, and E. J. Brutten and D. J. Shoemaker.

Stuttering as a specific operant behavior is considered by Shames and Sherrick. They discuss stuttering from a Skinnerian point of view. In this instance, the underlying cause or onset of stuttering is not known, nor is it of real concern. Of concern, are the positive reinforcements, negative reinforcements and/or punishment which lead to the development of stuttering.[1,8]

For Shames and Sherrick

> "....a stutterer's particular speech patterns depend on response contingent reinforcement. Thus, if the listening environment elicits a changed form of speech and this change brings reinforcement from the environment, this behavior will occur more often. Stuttering can be maintained by negative as well as positive reinforcement."[8,p.16]

Wischner theorizes that the onset of stuttering is dependent on the presence of learned anxiety.[1,2,8] Anxiety can result from punishment of any kind of behavioral pattern. If punishment of a speech activity, e.g., normal disfluency, is consistent the probability is increased that speech-associated anxiety will result. If the child continues to experience unpleasant reactions from significant persons in his environment, speech under certain circumstances becomes a response-produced cue for eliciting anxiety. This state causes the child to avoid the noxious stimulation. Wischner goes on to say

> "Anxiety....may lead to stuttering if it serves as a drive to avoid the painful stimulation that is associated with normal disfluency. This drive to avoid the noxiousness of adult disapproval might

result in the absence of all language were it not for the fact that the drive to communicate is in conflict with it. This conflict between the desire to speak and the fear of speaking generates random speech behavior. The particular random speech responses that are learned are those that lead most consistently and successfully to the avoidance of punishment. This is, of course reinforcing. But this reinforcement of anxiety reduction leads further to the learning of speech responses that are not only different from normal disfluent behavior but may also result in a generally faulty use of the speech organs. The learning of these different-from-normal avoidant speech responses signifies the existence of stuttering behavior."[8,p.9]

Thus, Wischner is saying that: 1) the stutter represents a disintegration of organized speech behavior caused by the stressful anxiety specific to the speech act, and 2) the anxiety and the stutter are learned. The resulting speech behavior is due to an approach-avoidance conflict--the stutterer wants to speak, but fears to because of possible disapproval; consequently, a pattern of speech which delays the saying of words is reinforced as adaptive behavior.[1,2]

According to Wischner stuttering is perpetuated by reinforcement. The maintaining reinforcement may result from: 1) the tension reduction when a feared word is complete; 2) the anxiety reduction when a feared word or speech situation is avoided; 3) the confirmation of the expected stutter after certain speech difficulties; and 4) the secondary gains for stuttering, e.g., stutterers may learn to use their symptom to obtain consideration from

listeners or to control a speech situation so that others must wait and listen.[1,8] He also considers stuttering's resistance to extinction as a perpetuating factor. In this case, reinforcement is based on the successful avoidance of noxious stimulation which makes extinction more difficult.[1,8]

Sheehan's theory uses learning principles but he includes various psychoanalytic concepts, as well. He advocates that stuttering is symptomatic of a double approach-avoidance situation.[2] The two conflicting alternatives are 1) the desire to speak because it achieves communication and the desire not to speak because shame and guilt will accompany the stutter; and 2) the desire to remain silent so as to avoid shame and guilt and the desire not to remain silent so as to avoid the frustration and guilt accompanying unwanted silence.[1,2,8] "Guilt becomes attached to both choices, and stuttering is the resulting compromise between speech and silence."[8,p.12]

Sheehan contends that approach avoidance conflicts can arise at five different levels--word, situation, emotional content, relationship and ego-protective; any particular moment of stuttering is determined by the interplay of forces at these levels.[1,16]

> "Thus, conflict may result from the need to speak and the avoidance of a) words and their phonic elements which through past conditioning have become indicators or cues of a noxious state, b) situations that provoke fear because of previously punishing experiences, c) spoken expressions that have threatening emotional content, d) relationships with individuals in a position of authority, and e) ego-testing circumstances which threaten failure or success."[8,p.12]

Stuttering is the result of response conflicts that are expressed through speech and is terminated when the conflict is resolved. Sheehan proposes

that the conflict is resolved with the occurrence of stuttering because the stuttering reduces the fear-motivated avoidance.[8]

> "During the moment of stuttering, there must be sufficient reduction of fear, avoidance tendency, and conflict to 'release' the blocked word. Were it not for this fact, once the stutterer became stuck on a word, he would remain stuck indefinitely. From the fear reduction which occurs during the block, and following the release from it, the stuttering is reinforced and maintained, the anxiety is 'bound' within it, and a vicious circle is perpetuated."[16,p.114]

Sheehan differs from Wischner in that he places more emphasis on motivational conflict and he integrates various concepts of psychoanalytic theory with learning theory.[2] The basis for stuttering is the approach-avoidance conflict situation, but Sheehan

> "....also assumes that both the cause and intensification of the conflict lie in guilt feelings, and he sees the particular behavioral pattern that develops more as a psychodynamically construed defense system than as a set of responses reinforced by drive reduction."[8,p.13]

Wendell Johnson has suggested that stuttering is brought on by a faulty evaluation of normal non-fluency. He states the parents misinterpret normal nonfluency as stuttering and become anxious which causes the child to become anxious. Subsequently, various methods to overcome the stuttering are employed, by the child, which only lead to a greater tendency to stutter.[1,2,4,5,10,16,17,33] Johnson's theory has had considerable influence upon the direction of research and therapy in stuttering. Although the theory has received criticism, knowledge of stuttering would be in a

poorer state if it had not been for Johnson's enthusiasm and understanding of this facet of the problem.[1]

Johnson's theory is probably the most well known and most accepted learning theory of stuttering. Perhaps it is justified to present some of the conflicting research reports with regard to his theory as they may generalize to other learning approaches presented in this paper. Some of the most poignant criticisms directed at Johnson's work have been presented by Wingate.[36,37,38] In his research, Wingate[36] has shown that in children non-fluencies do exist and they are extremely variable from child to child. There are a few children who exhibit sound and syllable repetitions which lead to a diagnosis of stuttering he says, but in "....most children word and phrase repetitions constitute the normal non-fluencies and are rarely identified as stutterers."[1,p.24]

Wingate[37] also believes, that while research has indicated that parents of stutterers in our culture are more demanding and perfectionist, and therefore less tolerant of stress, cross cultural studies offering information of this problem are unrewarding or methodologically unsound. He also points out that it has not been established that parents of stutterers are more prone to mis-diagnosis stuttering.

Wingate[38] also questions Johnson's proposition that children who are penalized for normal non-fluencies will develop stuttering. Wingate[38] presents evidence indicating that "....stutterers subjected to this type of penalty nevertheless recover spontaneously."[1,p.24]

Stuttering as a conditioned or learned behavior is also considered by Brutten and Shoemaker.[8] They suggest stuttering is a form of fluency failure resulting from classically conditioned negative emotion. The

involuntary prolongations and repetitions are evidence of speech disintegration caused by emotional stress and are unique to stuttering behavior. They go on to say that certain instrumental responses have become associated with stuttering but they are not common to all stutterers, therefore, they are not definitive of stuttering behavior. Many instrumental responses attempt to contend with noxious stimuli; if these responses allow the organism "....to avoid or escape the negative emotional state which is the antecedent to and the possible consequence of fluency failure,"[8,p.61] they become associated with stuttering.

The treatment of stuttering by learning techniques essentially attempts to extinguish deviant behavior and replace it with a "more acceptable" behavior. The extinction of deviant behavior can occur using classical conditioning or instrumental conditioning. Extinction procedures in classical conditioning consist of presenting the conditioned stimulus without the unconditioned stimulus or with a stimulus leading to an incompatible, competing response.[8,35] The first procedure is called experimental extinction or deconditioning; when a new, competing response is elicited it is called counterconditioning or desensitization.[8,35] Procedures for removing deviant behavior with instrumental conditioning involve not reinforcing the instrumental response when it occurs, or massing responses with only mild reinforcement.[8] This procedure is called operant extinction or reactive (or response) inhibition; if the organism learns not to respond it is called conditioned inhibition.[8,35]

There are some data which make it apparent that "....the removal of cues indicative of past stuttering and the consequent increase in signs of fluency result in significantly increased adaptation and decreased negative

adjacency."[8,p.82] This suggests that an increase in positive emotion is the resultant of these behavioral changes. Therapy based on this information is "....directed at both the desensitization of noxious cues and the acquisition of positive cues."[8,p.82]

The process of desensitization, emphasized by Wolpe, has been used with stutterers. Systematic desensitization facilitates certain behaviors by reducing the anxiety which is suppressing them. By desensitizing a stutterer's speech anxiety, several authors have been able to diminish stuttering behavior.[18,39,40]

Research concerning the effect of operant conditioning on stuttering has indicated "....that the overt behaviors emitted by 'chronic' adult stutterers may respond to carefully structured behavior therapy programs based on operant conditioning procedures."[20,p.343] Few studies have used positive reinforcement contingent upon fluency to reduce the frequency of stuttering.[20] Studies which have used positive reinforcers have not found especially favorable results,[15,21] or they have only been concerned with stuttering in laboratory environments and/or with specific tasks, e.g., machine reading tasks.[26]

The use of punishment, as an operant technique with stutterers, has typically been viewed as an undesirable means of controlling behavior.[6,17,29,30,34] Martin points out that most investigations using punishment indicate stuttering frequency increased under conditions of aversive stimulation.[20] In most of these earlier studies, the aversive stimulus was not specifically contingent upon stuttering;[9,14] more recent studies using punishment indicate that, under certain conditions, the use of punishment is an effective technique for decreasing stuttering

frequency.[12,15] Comparing the studies using punishment with stutterers indicates that when a stuttered response is immediately followed by a punishing stimulus the result is almost always a decrease in disfluency.[27] "No study has been published in which response contingent punishment resulted in increased disfluency."[27,p.177]

Other operant techniques, such as "time out"[21] and shaping,[32] have been successful in decreasing the frequency of stuttering. In the "time out" situation, the stutterer is instructed not to speak for a designated amount of time after each disfluency or stutter.[21] Shaping or successive approximation involves reinforcing behaviors which one wishes to establish; gradually only select behaviors which come closer and closer to the goal behavior are reinforced.[35] The shaping procedure can involve the use of delayed auditory feedback (DAF). A review of the research of DAF with stutterers reveals the following results:

> "1) under DAF the stutterer's rate of speech is generally prolonged and the frequency of stuttering is reduced; 2) the effect of DAF on the fluency of stutterers seems to persist after the delay has been eliminated from the feedback, and oral reading rate subsequently can be shaped to a more normal pattern; 3) DAF may be a more effective means of reducing stuttering than is auditory masking; and 4) there is no valid way of comparing the speech of stutterers under NAF and the speech of nonstutterers under delayed conditions."[32,p.28]

The treatment of stuttering remains a formidable task and combined techniques may prove more helpful in the future, than single techniques in the past. For example, using classical and operant conditioning in the same situation (in a Wolpian frame of reference); or using operant conditioning with reinforcement and punishment in the same situation.

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